

WETLAND RESTORATION PLAN

Williston Village RV Resort
Section 24, T155N, R101W
Williams County, North Dakota
Project #4554

Prepared for:

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September 17, 2013



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EXECUTIVE SUMMARY

Construction of the Williston Village RV Resort (RV Resort) has impacted a wetland that appears to be connected to Camp Creek. A wetland delineation conducted by Carlson McCain, Inc. determined that 4.5 wetland acres were impacted by construction activities (Carlson McCain, 2013). Removal of the fill materials will restore the wetland to pre-impact conditions.

The RV Resort will remove fill materials to the original surface elevation of the impacted wetland area and restore it to pre-impact conditions which will restore its hydrologic regime. Conventional excavation equipment (dozers, scrapers, and backhoes) will be used to remove the fill materials. Precise construction staking, implementing Storm Water Pollution Prevention Plan (SWPPP) measures, and consistent surveys will ensure the fill materials will be removed to the original wetland surface and limit impacts to the wetland area. Hydrophytic vegetation will be seeded in and wetland hay from adjacent wetlands will be spread on the original wetland surface to aid in the establishment of hydrophytic vegetation.

The impacted wetland is located in the NE¼ of Section 24, T155N, R101W. The amount of wetland impacts and restoration details are summarized in Table 1.

Table 1. Summary of Wetland Impact and Restoration Site

Impacted Wetland Location	Williams County	Section 24, T155N, R101W
Project Wetlands	PEMA/PEMC (Cowardin 1979)	
Wetland Impact	4.5 Acres	
Restoration Site	Williams County	Section 24, T155N, R101W
Type of Restoration	Remove fill materials from impacted wetland area to original surface elevations	
Fill Types (Amount)	Topsoil (30,000 cubic yards) and clean fill (118,000 cubic yards)	
Restoration Wetland	4.5 acres with seasonal hydrologic regime	
Years of Monitoring	5 years	

The restored wetland will be monitored for up to 5 years but may be terminated prior if the U.S. Environmental Protection Agency (EPA) deems the restoration successful. A monitoring plan is also included in this Restoration Plan.

Williston Village RV Resort Wetland Restoration Plan
Section 24, T155N, R101W
Williams County, North Dakota

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1.0 INTRODUCTION

Construction of the Williston Village RV Resort (RV Resort) impacted 4.5 wetland acres by filling a former oxbow/meander channel of Camp Creek (Appendix A). Camp Creek flows east through the northern portion of the RV Resort property toward the Little Muddy River. Fill was placed into the former oxbow/meander channel during construction activities. A wetland delineation that evaluated historic aerial photos and current field conditions determined the area of impact. This restoration plan identifies the project impacts to the wetland and describes the removal of those impacts.

The wetland is located on the north edge of the RV Resort property near Williston, North Dakota, in the NE¼ of Section 24, T155N, R101W (Appendix A).

Table 2. Impacted Wetland Area

Wetland	NWI	Acres*	Wetland Impact Acres
Wetland 1	PEMA/PEMC	4.5	4.5
		Total	4.5

*Acreage estimated from wetland delineation contained in Wetland Delineation Report (Carlson McCain, 2013).

The RV Resort will conduct and oversee the restoration of the impacted wetland.

2.0 EXISTING SITE CONDITIONS

The impacted wetland is located on the RV Resort property and is classified as Palustrine Emergent Temporarily Flooded (PEMA) and Palustrine Emergent Seasonally Flooded (PEMC). The wetland area was a former oxbow/meander channel of Camp Creek and is located in the Little Muddy River watershed. The impacted wetland area has been determined at 4.5 acres.

2.1 Impacted Wetland Physical Conditions

The impacted wetland had a seasonal hydrologic regime. Its hydrology was influenced by surface water flow and by groundwater (approximate 9 inches in depth as varies seasonally from 0-18 inches in depth) flow through the site. The impacted wetland contains Harriet soils and was vegetated with saline tolerant species. Alkali grass (*Puccinellia nuttalliana*), saltgrass (*Distichlis spicata*), and foxtail barley (*Hordeum jubatum*) are prevalent along the edge of the impacted wetland area. The uplands surrounding the impacted wetland area consist of Williams-Zahl loams which contain an average depth of groundwater to be greater than 80 inches. The depth of groundwater in the area has been estimated to be near an elevation of 1880 feet above sea level and this is consistent with the surface of the impacted wetland area.

Approximately 148,000 cubic yards of fill materials were inadvertently placed in the wetland area. Approximately 30,000 cubic yards of upland vegetated topsoil was placed on the original wetland surface and 118,000 cubic yards of clean fill was placed on the topsoil fill materials. The clean fill materials were identified as sandy lean clay glacial till and/or sandy coarse alluvium.

The vegetated topsoil fill materials consist of Williams-Zahl loams, (surficial clayey sand) which were placed on the original wetland surface. Clean fill materials were placed on top of the vegetated topsoil fill material.



Photograph 1. View of the fill materials located within the downstream portion of the impacted wetland area.



Photograph 2. View of upstream edge of the impacted wetland area. Surface water accumulated in the upstream portion due to the fill materials.

3.0 PROPOSED SITE CONDITIONS

3.1 Restoration Activities

Restoration activities will include removal of fill materials to the original elevations of the impacted wetland surface. The original surface elevations range from 1882.98 (upstream edge) to 1876.95 (downstream edge). Prior to impact, water flowed east through the wetland towards Camp Creek.

Approximately 148,000 cubic yards of material will be removed to restore the impacted wetland to its original ground surface. Conventional excavation equipment (dozers, scrapers, backhoes) will be used to remove fill materials. The use of conventional excavation equipment will ensure the restoration is completed quickly which will allow the restored site to quickly resume wetland functions. The excavation equipment will access the impacted wetland area from the south across upland areas. Excavated fill materials will be placed on the surrounding upland areas to the south and east of the impacted wetland area (Appendix A).

The boundaries of the fill area will be staked by surveyors to limit impacts to adjacent wetland areas. Grade elevations of the depth of fill to be removed will be staked on a 100 foot grid across the area of fill. Surveys and staking of grade elevation of the depth of fill will be conducted routinely to insure that all fill materials are removed and over-excavation of the impacted wetland area does not occur.

Best management practices will be implemented by the contractor while removing fill materials from the impacted wetland area. Storm Water Pollution Prevention Plan (SWPP) measures will be implemented to limit impacts to adjacent wetlands (Appendix B). Additional measures will include the use of construction mats or low ground pressure equipment if the site becomes saturated or as the excavation approaches final grade to reduce compaction of the impacted wetland area. Silt fences placed along the upstream and downstream wetland edge will be removed following the excavation of the fill materials. Additional silt fences will be placed at the base of the graded slopes following the removal of the fill materials to keep sediment from the graded slopes from eroding into the wetland. These silt fences will be left in place for a minimum of three years or until the graded slopes are stable and vegetated.

The equipment used, excavation activities and grade elevation staking will be inspected daily by Mr. Kyle Brock and/or Mr. John Reeves (onsite supervisors).

Grading of the adjacent slopes will also be conducted during the removal of the fill materials. At least four inches of topsoil will be spread on the graded slopes to aid the growth of native vegetation species.

3.2 Restoration of Wetland Functions

Restoration of the impacted wetland's hydrologic regime will be accomplished by removing fill materials to the original surface elevations. Removal of the fill materials will allow surface run-off, high water from Camp Creek, and groundwater to inundate and saturate the wetland area.

Vegetation within the wetland area will be re-established by two methods: 1) seeding Nuttall alkaligrass and 2) spreading wetland hay across the wetland surface. Nuttall alkaligrass seeds will be broadcast across the surface of the wetland and then covered with wetland hay. The wetland hay will consist of Nuttall's alkaligrass, saltgrass, and foxtail barley. The wetland hay will provide an additional seed source to the wetland area and help to control erosion. The wetland hay will be collected from adjacent wetland areas along Camp Creek. Restoration of hydrology will also aid in re-establishing hydrophytic vegetation by allowing propagules to naturally flow into the wetland from high flows of Camp Creek. Table 1 indicates the proposed seeding mixture.

Table 1. Seeding mixture for restored wetland.

Species*	Mixture (%)	Pure Live Seed (Lbs/Ac)	Acres	Total Pure Live Seed (Lbs)
Nuttall alkaligrass	100%	1.5	4.5	6.8

*Seeding scheduled for fall of 2013 following removal of fill materials.

Native vegetation species will be seeded into the graded slopes adjacent to the wetland. Straw wattles will be installed on and straw chaff will be spread upon the seeded slopes to decrease erosion and aid in the establishment of vegetation on them. The vegetation will control erosion, reduce sedimentation, and provide wildlife habitat. The table below indicates the seeding mixture to be planted upon the site. The seed used to re-establish vegetation on the restoration site will be obtained from local plant sources.

Table 2. Seeding mixture for slopes adjacent to the restored wetland.

Species**	Mixture (%)	Pure Live Seed (Lbs/Ac)	Acres	Total Pure Live Seed (Lbs)
Little Bluestem	25%	1.50	2.0	3.0
Western Wheatgrass	25%	3.00	2.0	6.0
Needle and Thread	20%	2.85	2.0	5.7
Switchgrass	15%	0.79	2.0	1.6
Dotted Gayfeather	5%	0.60	2.0	1.2
Stiff Sunflower	5%	0.19	2.0	0.4
Purple prairieclover	3%	0.17	2.0	0.3
Purple Coneflower	2%	0.27	2.0	0.5

**Seeding should be conducted between May 1 and June 15, 2014.

3.3 Noxious Weed Species Management

Mechanical controls will be used to manage noxious weed species if they become prevalent within the restored wetland and adjacent slopes. The restoration site will be monitored annually by the RV Resort and appropriate steps will be taken to control noxious weeds. Noxious weeds identified by the North Dakota state list will be managed. Williams County does not list any additional noxious weeds.

*Williston Village RV Resort
Wetland Restoration Plan*

Plants identified as noxious weeds include:

- Absinth wormwood
- Canada thistle
- Diffuse knapweed
- Leafy spurge
- Musk thistle
- Purple loosestrife
- Russian knapweed
- Spotted knapweed
- Yellow toadflax
- Dalmation toadflax
- Salt cedar

4.0 MONITORING PLAN

The restored wetland requires subsequent monitoring of its hydrology and vegetation to ensure it is functioning correctly. The restored wetland will be evaluated with wetland criteria as identified in the *Great Plains Regional Supplement to the 1987 Manual (Version 2.0)* (USACE 2010) and *National Wetland Plant List* (Lichvar 2012).

Monitoring of the restoration site will be conducted for five years but may be terminated prior if the U.S. Environmental Protection Agency (EPA) deems the restoration successful.

4.1 Monitoring Methods

Monitoring of the restored wetland will consist of a field visit, a monitoring report, and follow-up to any questions or suggestions from regulatory personnel. Monitoring will be performed midway and near the end of the first and second growing seasons following removal of the fill materials. Subsequent monitoring will be conducted on an annual basis during the month of August. The restored wetland will be evaluated by the presence of indicators of wetland criteria, i.e., hydrology, and hydrophytic vegetation (hydric soils are already present) at representative observation points located along a sampling transect. The spatial location of the observation points and the photo points will be collected during the initial monitoring effort with a GPS to ensure that the same locations are evaluated during subsequent monitoring visits.

4.1.1 Photo Points

Photo points are a specified location in which field photographs will be taken. Photographs taken from a specified location and consistent direction will provide a visual account of the restoration and development of the restored wetland.

Photo points will be established in strategic locations in order to document the changes occurring within the restored wetland. The proposed locations and directions of the photo points can be seen in (Appendix A). The photo points will be marked with a metal stake and the spatial locations will be collected with a GPS. Photographs taken from these locations will have consistent camera settings and a documented viewing direction. Photo identification cards with pertinent information to the photo point will be placed in the photograph's field of view. Information documented on the photo identification card will include:

- Unique photo point identification
- Photographer's initials
- Date and time
- Magnetic declination
- Location

4.1.2 Wetland Vegetation

Wetland vegetation composition will be evaluated at each observation point following the guidelines set forth by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (USACE 2010). Areal cover of all vegetation species and percent bare soil will be evaluated within a 1 meter squared quadrat at each observation point. An overall vegetation species list of the restored wetland will be compiled with species noted at the observation points and those observed while traversing between them. The restored wetland will be surveyed for the presence of noxious weeds. The adjacent seeded slopes will be evaluated for the presence of noxious weeds and overall presence/growth of the seeded species.

4.1.3 Wetland Hydrology

Wetland hydrology indicators will be evaluated at each observation point following the guidelines set forth by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (USACE 2010). Hydrology indicators will also be identified while traversing between observation points.

4.2 Problem Areas

Problem areas will be identified and documented during the monitoring visits. Photographs and notes detailing each problem area will be collected during the field monitoring. Problems areas may involve erosion, areas barren of vegetation, patches of noxious weeds, etc.

4.3 Monitoring Report

Monitoring reports will be completed after each monitoring visit and submitted. Each report will describe the environmental conditions at the site and assess the relative success or failure of restoration efforts. The report will include:

- Name and contact information of permittee, point of contact, and field observer(s)
- Name of person conducting monitoring reports and dates of monitoring visits
- Directions to and map of mitigation area
- Summary paragraph describing the project's purpose, environmental conditions at the site, and restoration action
- Timeline of restoration activities and final date of completion
- Photographs and a narrative summary of the restored wetland's relative success or failure per success criteria
- Photographs and descriptions of any problem areas
- Recommendations for corrective or remedial actions (if necessary)
- Description and dates of implemented corrective actions (if applicable)

5.0 RESTORATION SUCCESS CRITERIA

Success criteria variables are essential to evaluating the restored wetland. The success of the restored wetland will be based on the re-establishment of hydrology and hydrophytic vegetation and the management of noxious weeds.

5.1 Wetland Hydrology

Wetland hydrology will be restored following the removal of the fill materials. Indications of hydrology observed during the monitoring visits will indicate success for the restored wetland. Indications of hydrology will also be compared to adjacent wetlands.

5.2 Hydrophytic Vegetation

Hydrophytic vegetation will be deemed successful when these species comprise greater than 50 percent of areal coverage and be considered dominant species within the observation points. The percent of bare soil will also decrease as vegetation is re-established. Percent bare soil should be considered successful when it comprises less than 15 percent of areal cover.

5.3 Noxious Weed Coverage

Noxious weeds in and around the restored wetland will be evaluated and overall coverage will be determined. Management of noxious weeds will be implemented by request if restoration success criteria goals are not met. Noxious weed coverage should be considered successful when it comprises less than 10 percent of areal coverage.

6.0 RESTORATION CONTINGENCY MEASURES

The RV Resort anticipates that the success criteria variables will be met with the proposed restoration of the wetland. However, contingency measures may be necessary to correct unforeseen problems and provide remedial actions for the restored wetland. The RV Resort will be responsible to provide remedial actions.

Contingencies are based on the success criteria variables of the monitoring plan and provide methods to correct potential problems. Potential situations and contingencies are described below. Not all future problems can be foreseen; therefore, additional contingencies may need to be developed and implemented to remediate the situation. Prior to any contingency measure being implemented, an evaluation of the situation and consultation and coordination with the EPA will take place to determine the appropriate course of action.

6.1 Vegetation Contingency Measures

Contingency measures for wetland vegetation may involve the following actions:

- Physical control (i.e., mowing, haying, or grazing after the nesting season)
- Reseeding
- Additional seeding

Physical control methods will be implemented if the vegetation success criteria variables are not met during the monitoring period.

6.2 Wetland Hydrology Contingency Measure

Contingency measures for wetland hydrology may involve the following actions:

- Additional removal of fill materials
- Removal of sedimentation or erosion materials

This action will be implemented if the wetland hydrology success criteria variable is not met during the monitoring period. Hydrologic conditions will be compared with nearby wetlands of similar size and class.

7.0 INSPECTIONS

The restoration site and activities will be available for inspections by EPA personnel.

8.0 SCHEDULE

The removal of fill materials and restoration of the impacted wetland is of high priority so restoration activities will commence immediately upon acceptance of the restoration plan and receiving the notice to proceed. It will take approximately 45 days to finish the restoration activities so it is essential to start soon in order to beat the onset of winter weather. The anticipated completion of the restoration is prior to November 15, 2013. Monitoring reports are anticipated to be submitted for review within 45 days of the monitoring effort.

Anticipated schedule:

- Construction staking / Implementation of erosion control structures - September 30, 2013 or sooner if notice to proceed is received earlier
- Commence removal of fill materials - September 30, 2013 or sooner if notice to proceed is received earlier
- Completion of final grading and removal of fill materials - prior to November 15, 2013
- Completion and submittal of "As-built plans" - prior to November 15, 2013
- Seeding of restored wetland - prior to November 15, 2013
- Seeding of graded slopes adjacent to restored wetland - Spring 2014 (between May 1 and June 15)
- Biannual Monitoring - June and August 2014 and 2015 (subsequent reports submitted within 45 days of monitoring effort)
- Annual Monitoring - August 2016 - 2018 (if necessary), (subsequent report submitted within 45 days of monitoring effort)

RV Resort reserves the right to modify the anticipated schedule if unforeseen problems or inclement weather occurs.

9.0 REFERENCES

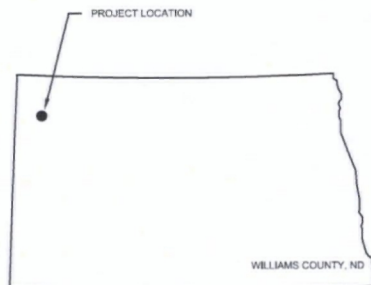
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Appendix A

Figures

WETLAND RESTORATION
PLAN DRAWINGS
WILLISTON VILLAGE RV RESORT
BRUNINI FIRM

SECTION 24, T155N, R101W
WILLIAMS COUNTY, NORTH DAKOTA



SHEET INDEX

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|---|---------------------|
| 1 | COVER SHEET |
| 2 | OVERALL VIEW |
| 3 | EXISTING CONDITIONS |
| 4 | GRADING PLAN |
| 5 | CROSS-SECTION |



LOCATION MAP
NO SCALE



NO SCALE

Revisions:
9/17/13 - Add Silt Fence



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I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of North Dakota.

Kirk L. Page

Paul C. Love

Date 9/10/2013 Reg. No. PE-8682

BRUNINI FIRM

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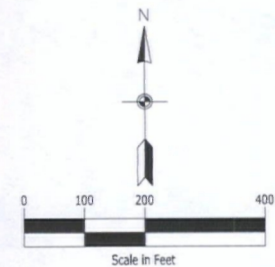
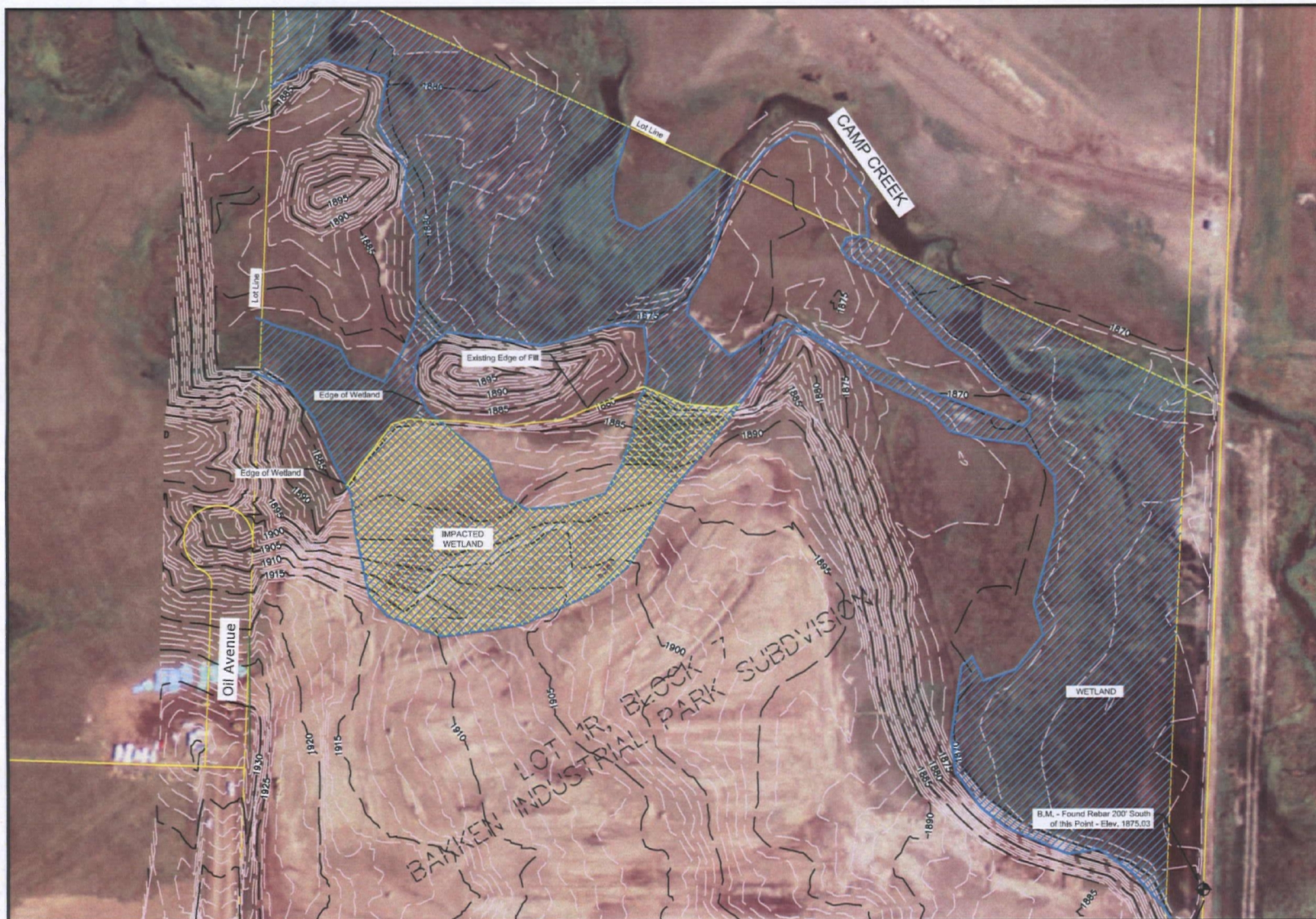
**WILLISTON VILLAGE
RV RESORT**

Williams County, North Dakota

WETLAND RESTORATION COVER SHEET

Project No. 4789

1 of 5



LEGEND

- 1869 CONTOUR (EXISTING)
- WETLAND
- IMPACTED WETLAND

NOTES

1. CONTOURS SHOWN WERE DERIVED FROM FIELD TOPOGRAPHY SHOT 6/5/2013.
2. 2012 NAIP AERIAL PHOTOGRAPHY SOURCE DATA.



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 Date 9/10/2013 Reg. No. PE-8682
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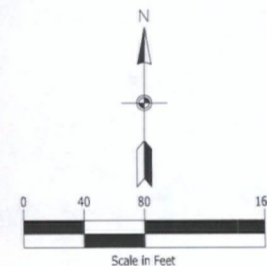
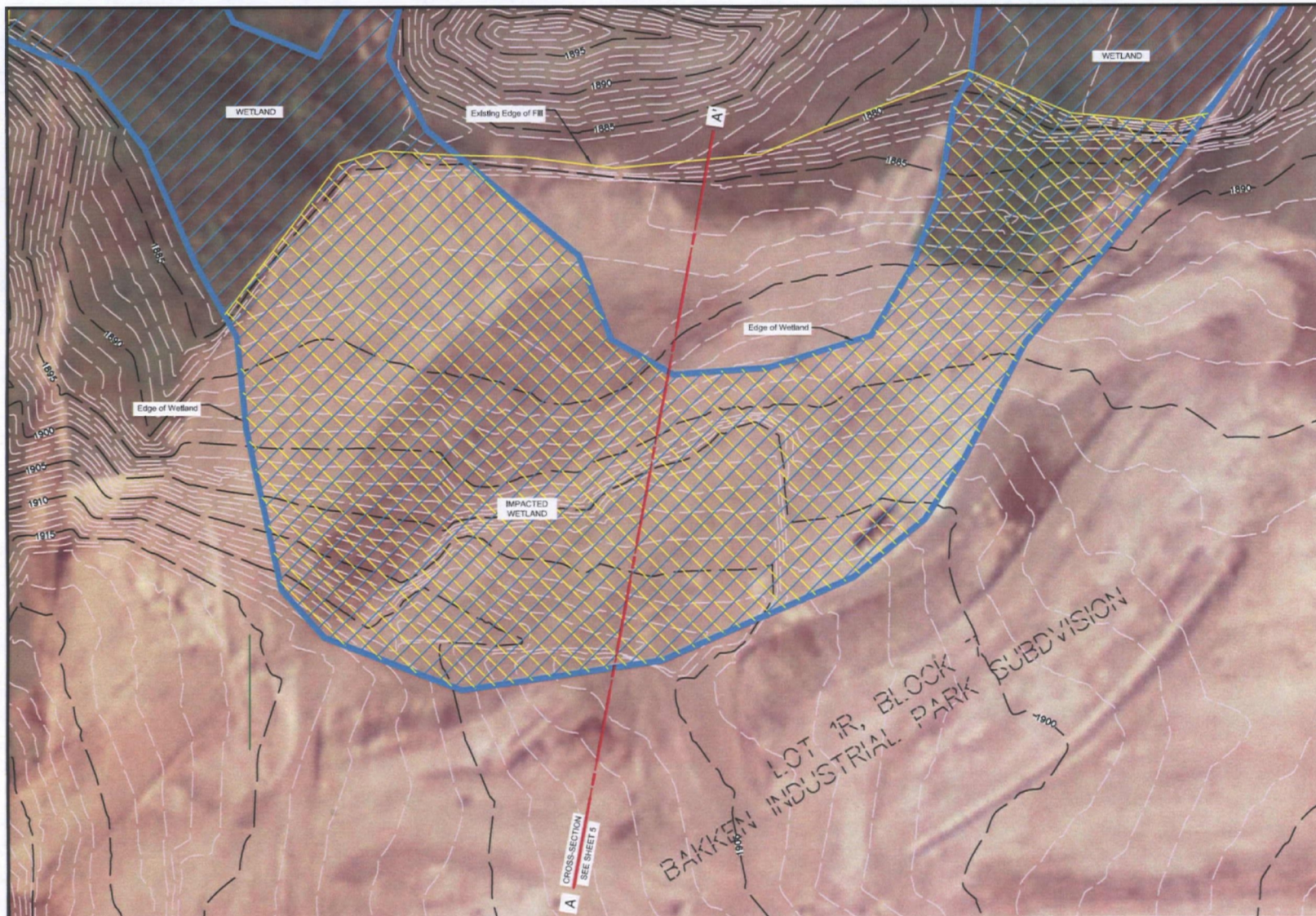
**WILLISTON VILLAGE
 RV RESORT**
 Williams County, North Dakota

**WETLAND RESTORATION
 OVERALL VIEW**

Project No. 4789

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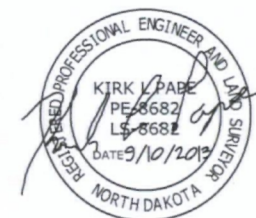


LEGEND

- 1890 CONTOUR (EXISTING)
-  WETLAND
-  IMPACTED WETLAND

NOTES

1. CONTOURS SHOWN WERE DERIVED FROM FIELD TOPOGRAPHY SHOT 6/5/2013.
2. 2012 NAPP AERIAL PHOTOGRAPHY SOURCE DATA.



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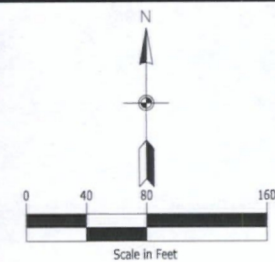
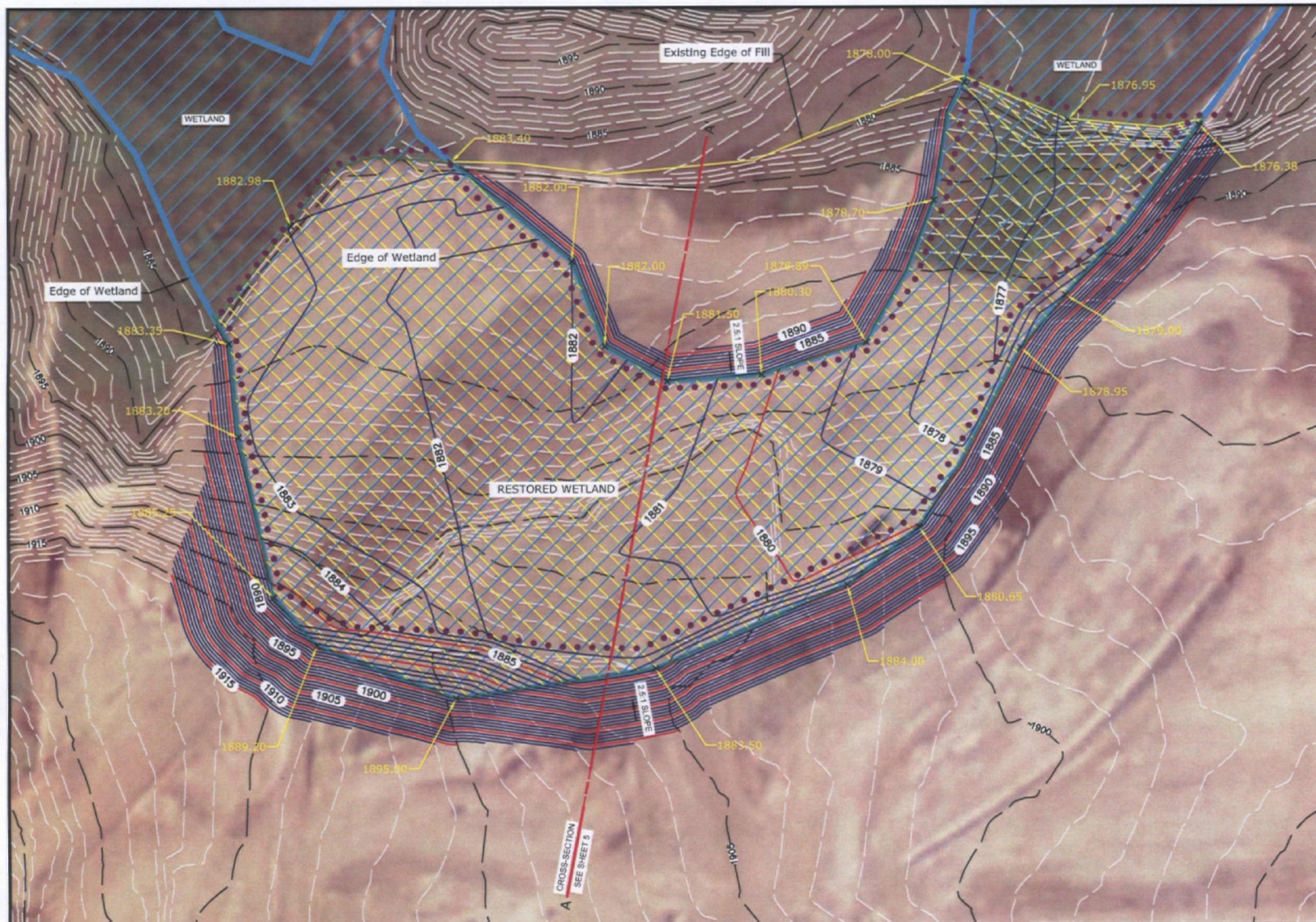
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**WILLISTON VILLAGE
RV RESORT**
Williams County, North Dakota

**WETLAND RESTORATION
EXISTING CONDITIONS**

Project No. 4789

3
of
5



- LEGEND**
- 1869 CONTOUR (EXISTING)
 - WETLAND
 - RESTORED WETLAND
 - 1870 CONSTRUCTED CONTOUR
 - PROPOSED SILT FENCE

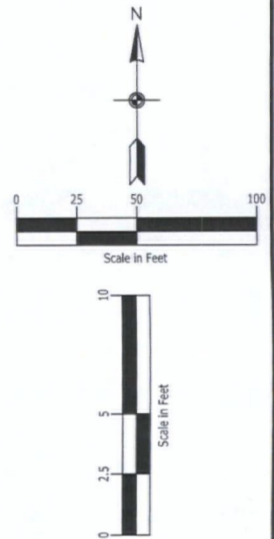
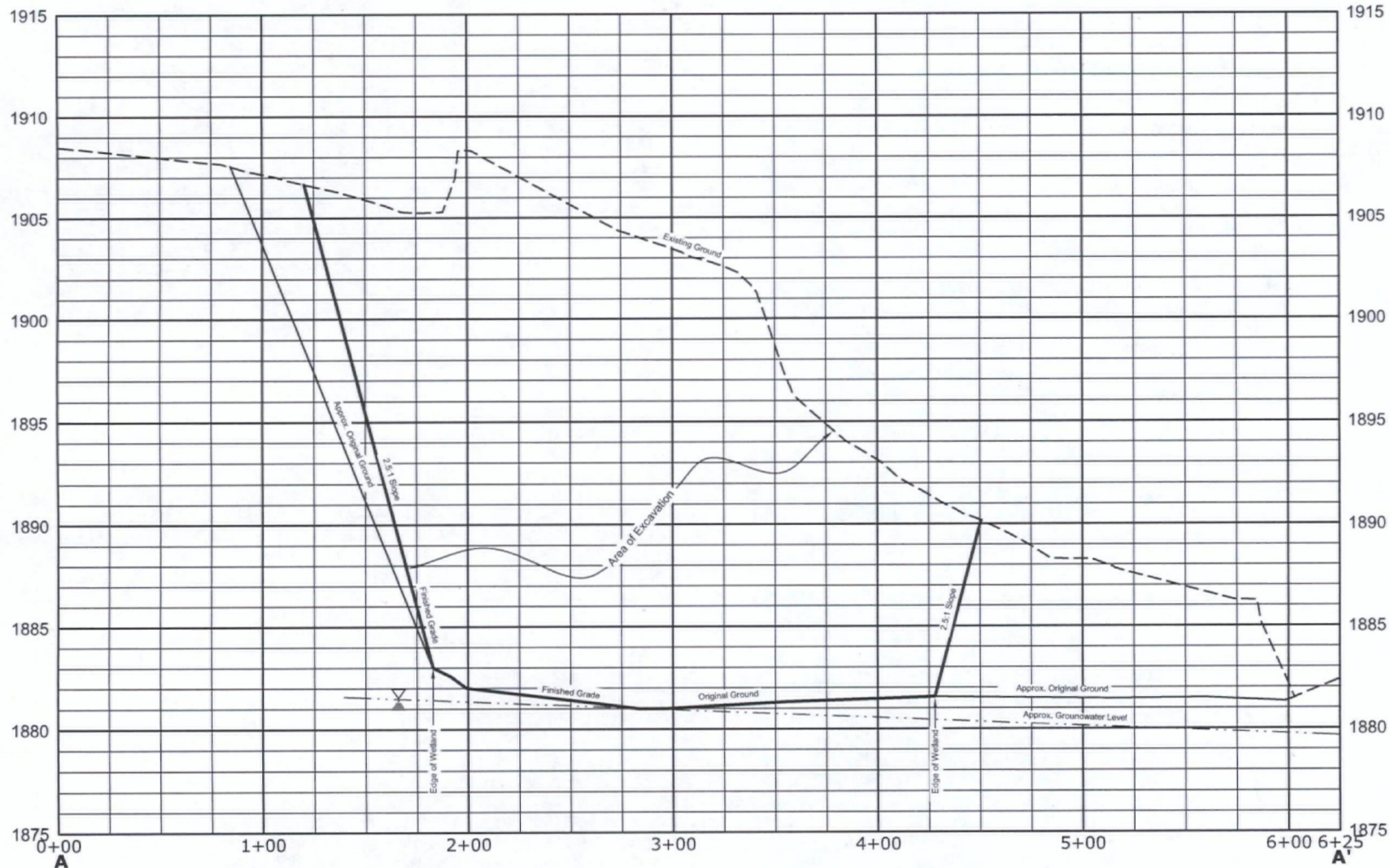
- NOTES**
1. CONTRACTOR SHALL FIELD VERIFY ALL COORDINATES AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. DEVIATIONS FROM THESE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE GRADING.
 2. 2012 NAD AERIAL PHOTOGRAPHY SOURCE DATA.
 3. SEED ALL DISTURBED AREAS.
 4. CONSTRUCTED CONTOURS SHOWN WITHIN THE IMPACTED WETLAND BOUNDARY ARE BASED ON THE 2012 SBL GRADING PLAN, WHICH REPRESENT THE BEST AVAILABLE EVIDENCE OF THE ORIGINAL GROUND ELEVATION BEFORE FILL BEING PLACED ON THE WETLAND. CONTRACTOR SHALL EXCAVATE TO THE ORIGINAL GROUND ELEVATION AS DETERMINED BY ON-SITE OBSERVATION BY QUALIFIED PERSONNEL DURING EXCAVATION OPERATIONS, REGARDLESS OF THE ELEVATIONS SHOWN HEREON.



 <p>Carlson McCain ENVIRONMENTAL - ENGINEERING - SURVEYING 600 S. 2nd St., Suite 105, Bismarck, ND 58504 Phone: 701-255-1475 Fax: 701-255-1477</p>	<p>I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of North Dakota.</p> <p style="text-align: right;">Kirk L. Pope</p> <p><i>Kirk L. Pope</i> Date <u>9/10/2013</u> Reg. No. PE-8682</p>	<p>BRUNINI FIRM 190 East Capitol Street Jackson, Mississippi, 39201</p>	<p>WILLISTON VILLAGE RV RESORT Williams County, North Dakota</p>	<p>WETLAND RESTORATION GRADING PLAN</p> <p style="font-size: small;">Project No. 4789</p>	<p>4 of 5</p>
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CROSS-SECTION A-A'



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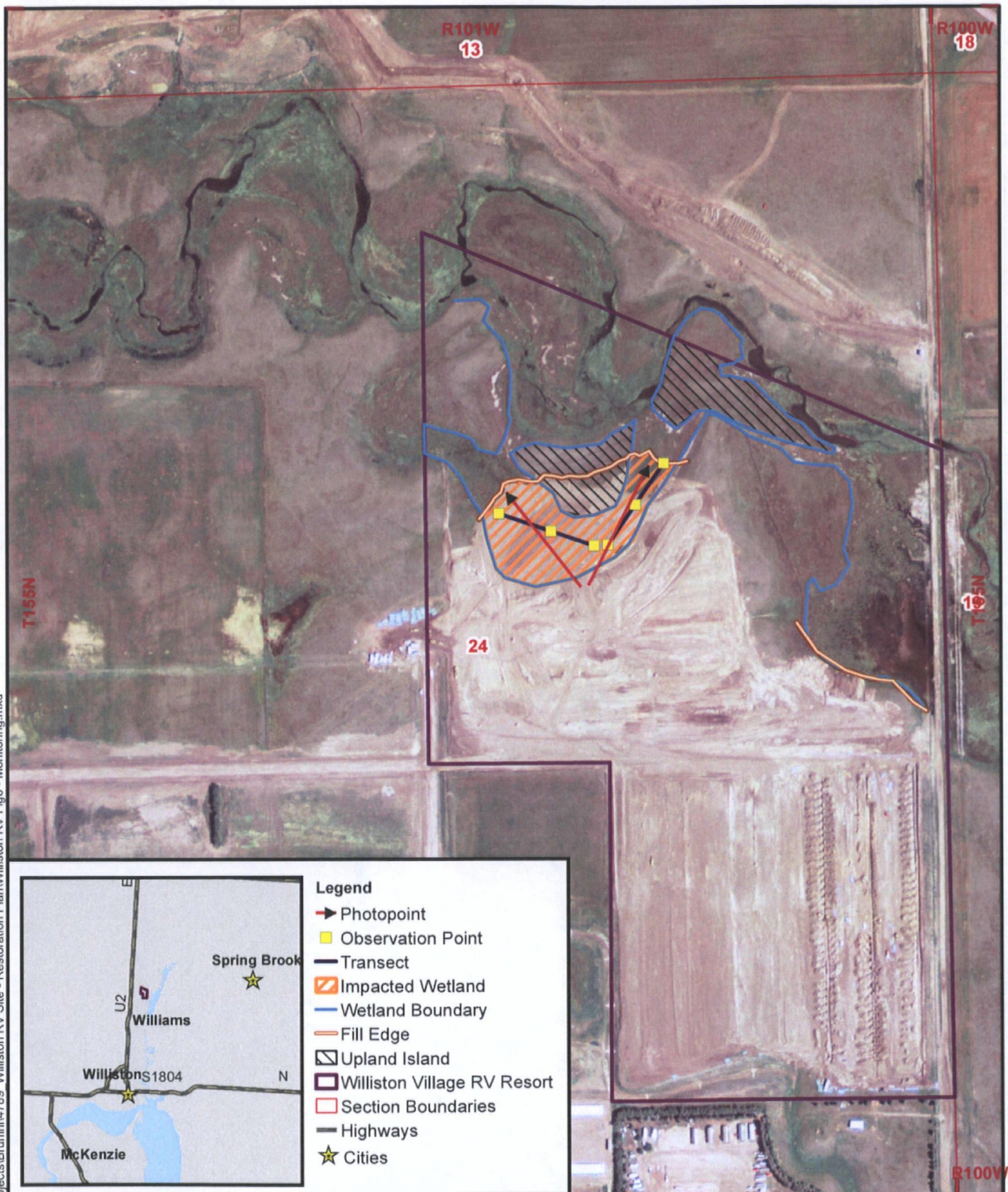
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**WILLISTON VILLAGE
RV RESORT**
Williams County, North Dakota

**WETLAND RESTORATION
CROSS-SECTION A-A'**

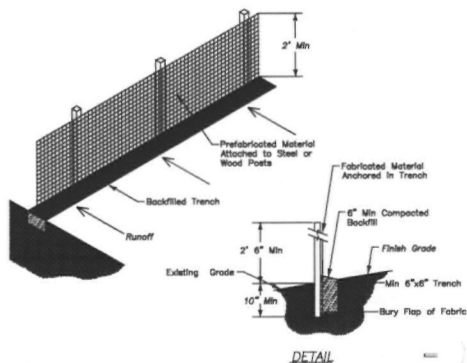
Project No. 4789

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of
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Appendix B

Storm Water Pollution Prevention Plan



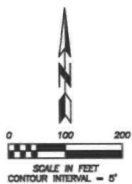
DETAIL

Notes:

1. Silt fence shall be installed before any earth removal or excavation takes place.
2. Set posts maximum 8 feet on center and excavate 6"x6" trench upslope along the line of posts.
3. Attach filter fabric to posts and extend it into trench.
4. Backfill and compact excavated soil.

SILT FENCE INSTALLATION

(NO SCALE)



NOTES

1. ALL DISTURBED AREA TO BE HYDROSEEDING UPON COMPLETION OF FINAL GRADING OF THE SITE AREA.
2. ALL TOPSOIL OR NATIVE MATERIAL PILES MUST BE LOCATED 200 FEET FROM ANY SURFACE WATER.
3. ALL RIPRAP WILL BE PLACED WITHIN 24 HOURS OF PLACEMENT OF THE PILES.
4. SEDIMENT BASINS SHALL BE IN PLACE PRIOR TO PLACEMENT OF THE STORM SEWER SYSTEM.
5. ROUGH GRADING OF THE SITE WILL DIVERT ALL STORM WATER TO THE SEDIMENT BASINS SHOWN.

QUANTITIES:

SILT FENCE - 4,360 LF

DESIGN ML PROJ. NO. 8888
 DRAWN MS DATE 05/28/23
 CHECKED ML SURVEYED MM

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WILLISTON, NORTH DAKOTA

WILLISTON VILLAGE MOBILE HOME PARK
 STORM WATER PROTECTION PLAN (SWPP)

SHEET
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